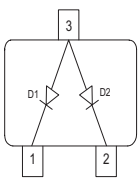


**Silicon TVS diodes**

- ESD / transient protection of CAN/LIN bus networks power supply lines according to:  
IEC61000-4-2 (ESD):  $\pm 30\text{kV}$  (air / contact)  
IEC61000-4-4 (EFT): 80 A (5/50 ns)  
IEC61000-4-5 (surge): 5 A (8/20 $\mu\text{s}$ )  
ISO7637-2: Pulse 1 (max. 50 V),  
Pulse 2 (max. 125 V), Pulse 3a, b (max.800 V)
- Max. working voltage: 24 V
- Low capacitance: 24 pF typ.
- Low clamping voltage: < 41 V
- Extremely low reverse current: < 1 nA typ.
- Pb-free (RoHS compliant) package


**Applications**

- Low and High-Speed CAN
- Fault Tolerant CAN
- Industrial control networks
- 12/24 V DC power supply lines


**ESD24VS2U**


Type	Package	Configuration	Marking
ESD24VS2U	SOT23	2 lines, uni-directional*	EUs

\* 1 line, bi-directional between pins 1 and 2, if pin 3 is not connected

**Maximum Ratings** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Value	Unit
ESD contact discharge <sup>1)</sup>	$V_{\text{ESD}}$	30	kV
Peak pulse current ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$I_{\text{pp}}$	5	A
Peak pulse power ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$P_{\text{pk}}$	230	W
Operating temperature range	$T_{\text{op}}$	-55...150	°C
Storage temperature	$T_{\text{stg}}$	-65...150	

**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**Characteristics**

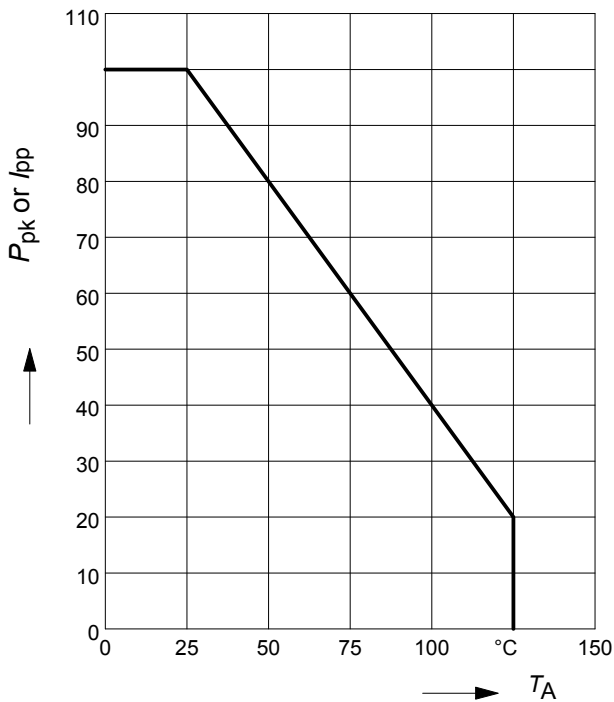
Reverse working voltage	$V_{\text{RWM}}$	-	-	24	V
Breakdown voltage $I_{\text{(BR)}} = 1 \text{ mA}$	$V_{\text{(BR)}}$	26	-	32	
Reverse current $V_{\text{R}} = 24 \text{ V}$	$I_{\text{R}}$	-	<1	10	nA
Clamping voltage $I_{\text{PP}} = 1 \text{ A}, t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup> $I_{\text{PP}} = 5 \text{ A}, t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$V_{\text{CL}}$	-	30 36	34 41	V
Line capacitance <sup>3)</sup> $V_{\text{R}} = 0 \text{ V}, f = 1 \text{ MHz}$ , (pins 1 to 2, pin 3 n.c.) $V_{\text{R}} = 0 \text{ V}, f = 1 \text{ MHz}$ , (pins 1 or 2 to 3)	$C_{\text{T}}$	-	24 48	28 52	

<sup>1)</sup> $V_{\text{ESD}}$  according to IEC61000-4-2. Device stressed with 10 positive / negative ESD pulses.

<sup>2)</sup> $I_{\text{pp}}$  according to IEC61000-4-5. Non-repetitive current pulse.

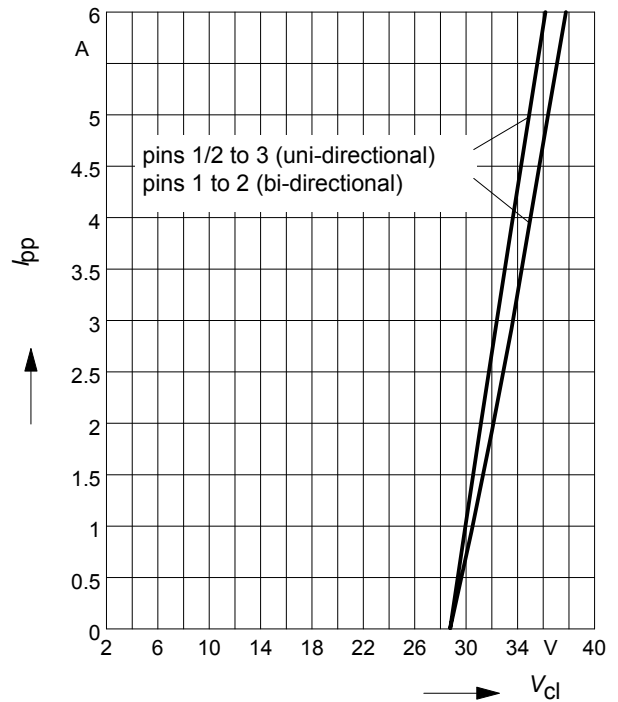
<sup>3)</sup>Total capacitance line to ground (per line)

**Power derating curve  $P_{pk} = f(T_A)$**



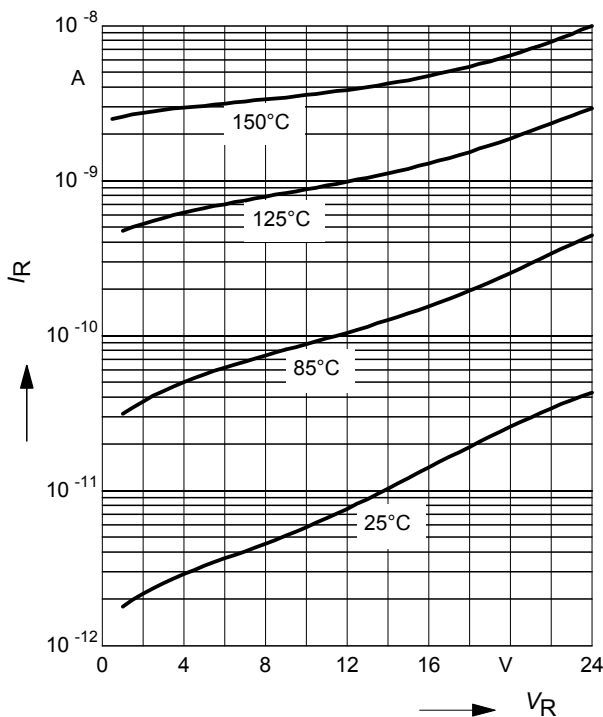
**Clamping voltage,  $V_{cl} = f(I_{pp})$**

$t_p = 8 / 20 \mu s$



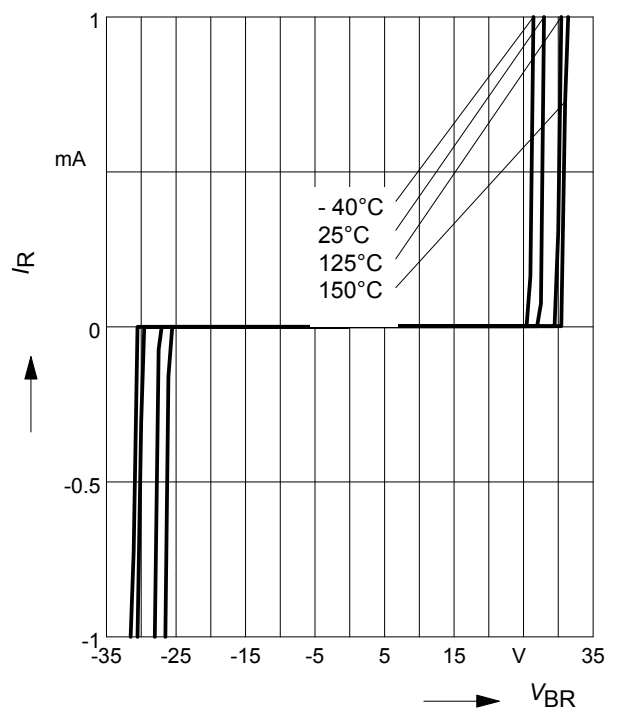
**Reverse current  $I_R = f(V_R)$**

$T_A =$  Parameter, pins 1 / 2 to 3  
( uni-directional )



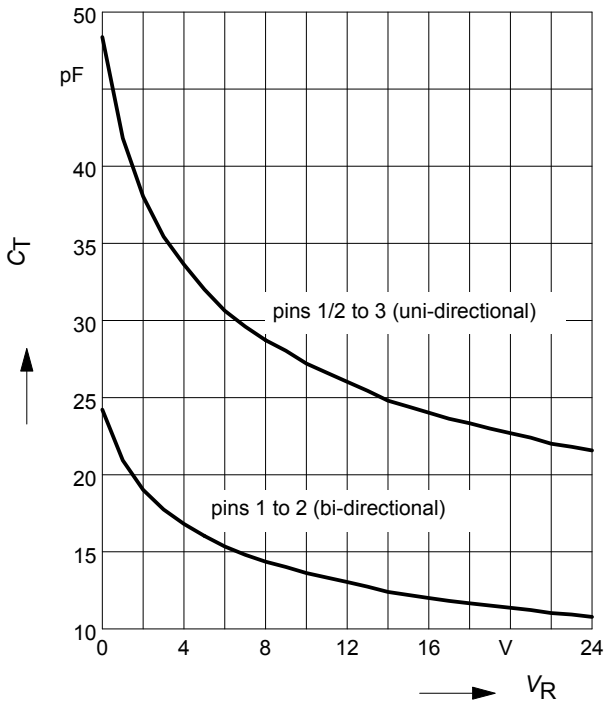
**Breakdown voltage  $V_{BR} = f(I_R)$**

$T_A =$  Parameter, pins 1 to 2  
( bi-directional )

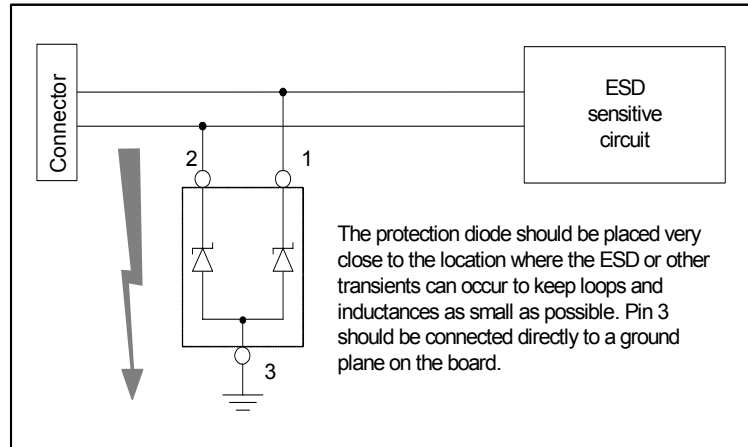


Line capacitance  $C_T = f(V_R)$

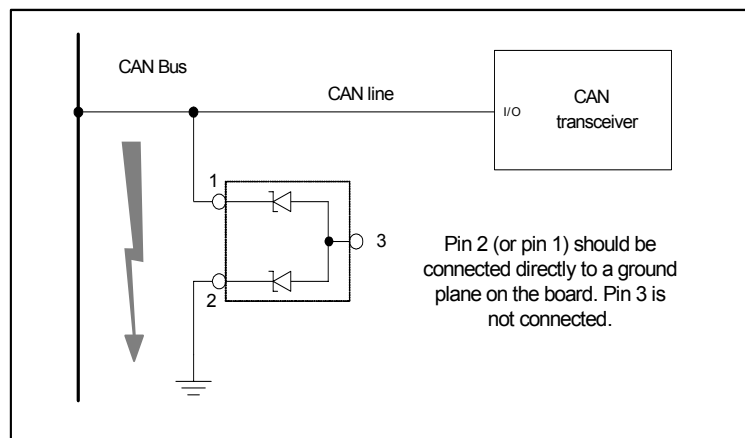
$f = 1\text{MHz}$



**Application example ESD24VS2U ( uni-directional )**  
 12V / 24V DC power supply line protection

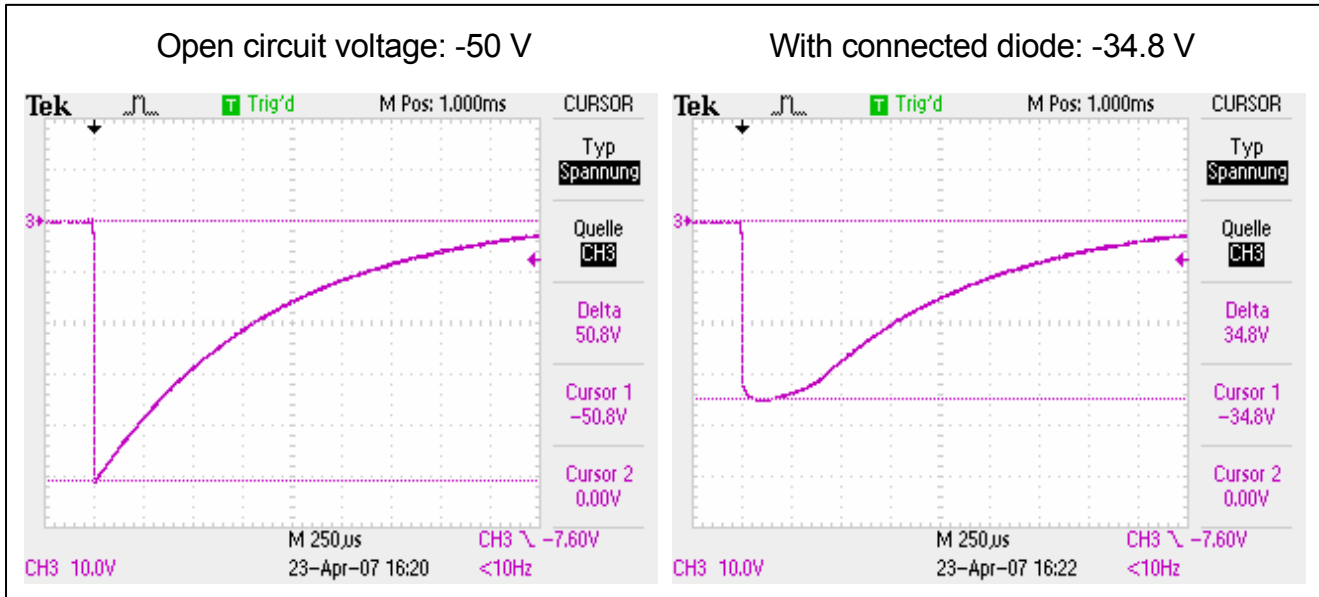


**Application example ESD24VS2U ( bi-directional )**  
 Single Wire CAN and LIN bus protection



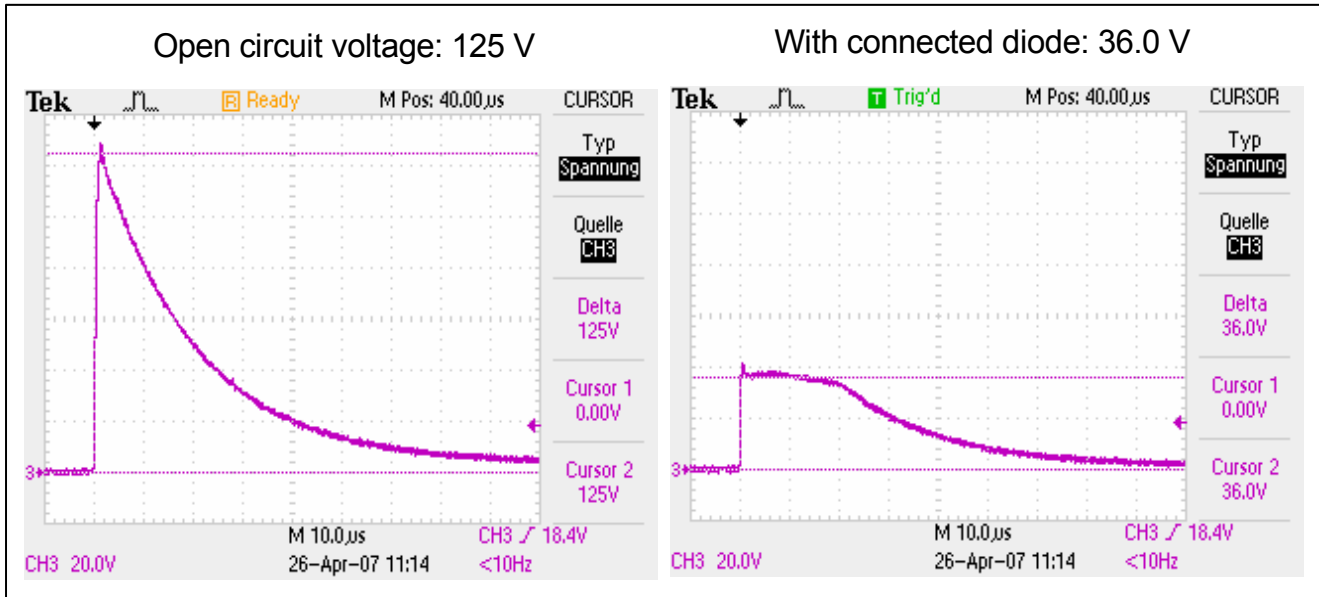
**Clamping voltage according to ISO 7637-2: Pulse 1**

Ri = 10 Ohm, td = 2 ms, 5000 pulses



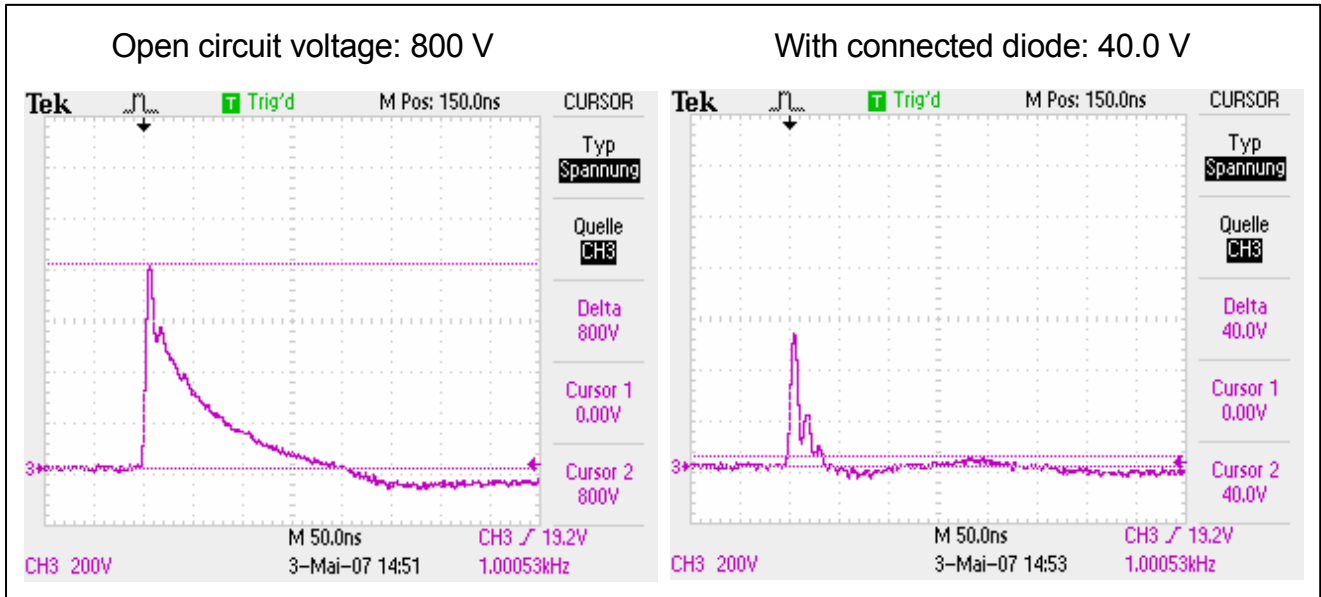
**Clamping voltage according to ISO 7637-2: Pulse 2a**

Ri = 10 Ohm, td = 2 us, 4000 pulses, 60 min



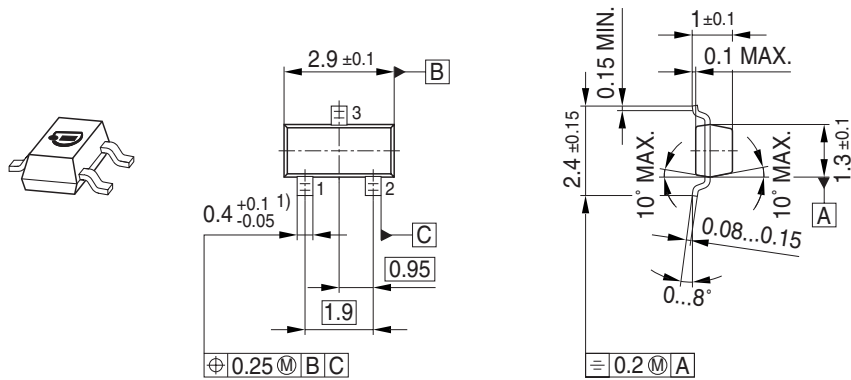
**Clamping voltage according to ISO 7637-2: Pulse 3**

Ri = 50 Ohm, td = 100 ns, 10 min



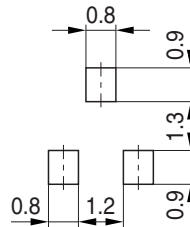


Package Outline

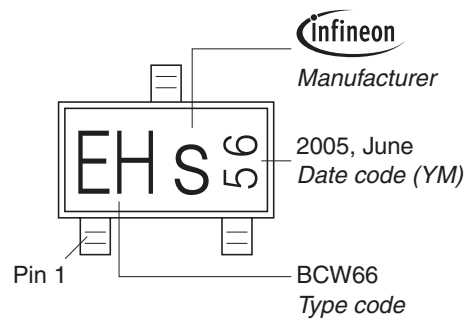


1) Lead width can be 0.6 max. in dambar area

Foot Print

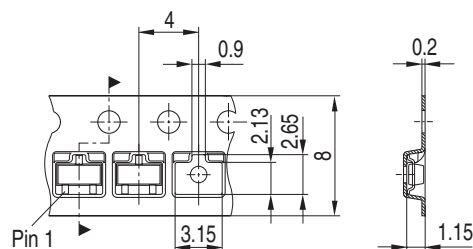


Marking Layout (Example)



Standard Packing

Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



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